

Clark (J. P.)

Tubercular Tumors of the Larynx.

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TUBERCULAR TUMORS OF THE LARYNX.

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It is not my intention in this paper to discuss the usual manifestations of phthisis laryngis. Tubercular infiltrations of the epiglottis, the arytenoids, and the inter-arytenoid space, and the masses of granulation-tissue often resembling papilloma springing from tubercular ulcerations are characteristic appearances familiar to all who have occasion to examine the larynx frequently. These appearances, although they may be considered in a sense tumors, do not come under the title as it is here applied. Tubercular disease of the larynx appears, very rarely, to manifest itself in the form of smooth, rounded tumors, single or multiple, or in the form of papillomatous growths which are found, on microscopic examination, to consist of tubercular tissue containing generally the bacilli of tuberculosis, and accompanied often by no or only slight manifestations of pulmonary tuberculosis. All such cases, as far as I know, which have been published I shall briefly review, bringing out only the important points, report a case of my own, and endeavor to draw some conclusions which may be of value.

As early as 1866 Tobold appears to have recognized the existence of tubercular growths of the larynx, although Ariza (1877) is generally considered as having been the first to call attention to them. In the case reported by the latter there was a tumor of the epiglottis which, on removal and microscopic examination, was found to be tubercular. Recurrence was rapid. E. F. Ingals mentions a case in which there was a distinct tumor, size of a split-pea, springing from the right arytenoid. There was evident pulmonary tuberculosis. The microscopic nature of the growth was not ascertained.

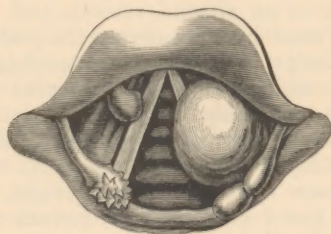
J. N. Mackenzie reports two cases observed *post mortem*: (1) Tumor of trachea, about $1\frac{1}{2}$ cm. above bifurcation; dense, smooth, size of bean, covered with mucous membrane, and consisting microscopically of tuberculous nodules. There were tubercular cavities in the lungs. (2) Whole upper compartment of the larynx presented a mammillary appearance, due to the presence of small, smooth, dense nodular growths under the intact mucous membrane, microscopically tubercular. There were tubercular cavities in the lungs. Gussenbauer's case was a man, aged twenty-four years, suffering from dyspnoea and aphonia caused by a tumor of the larynx. A diagnosis of carcinoma (supported by microscopical examination) was made, and total extirpation of the larynx was performed. The patient died several months later, of pulmonary tuber-



culosis. Another histological examination of the tumor showed it to have been tubercular. Schnitzler reports three cases: (1) A young man had cough for a long time, hoarseness for several months, dyspnoea for a few weeks. The larynx contained numerous growths (size of a bean to that of a hazelnut), grayish-white, not ulcerated, arising mostly from the ventricle, and almost filling the larynx, having the appearance of a papilloma. Tracheotomy was performed for dyspnoea. The tumors were removed with the guillotine and found to consist microscopically of a collection of miliary tubercles; cure. (2) Man, aged forty years, with pulmonary phthisis. Larynx healthy, except a grayish-white tumor size of hazelnut from the posterior tracheal wall. Tracheotomy; death. No autopsy mentioned. (3) Patient with pulmonary phthisis; had a number of smooth, non-ulcerated tumors springing from the ventricles. No further details were given. Lermoyez's case was a man, aged forty years, having an enormous polypoid growth on the right vocal cord, causing attacks of suffocation for which tracheotomy was done; death. Autopsy showed tubercular infiltration of both lungs. Percy Kidd has reported four cases: (1) Male, aged fifty years, had winter cough for two years; for eight months increase of cough, with hoarseness and dyspnoea. Consolidation at left apex. Larynx contained a pea-sized, smooth, rounded tumor arising from the angle between the arytenoid cartilage and the ventricular band. A symmetrical tumor gradually appeared on the right side. Marked signs of pulmonary phthisis developed, from which the patient died eight months later. The tumors consisted of an aggregation of miliary tubercles containing numerous tubercle bacilli. (2) Male, aged thirty-seven years, had cough for one year with expectoration, and a few months later hoarseness and dysphagia. Physical signs of phthisis present in both lungs. There were ulcerations in the larynx and a tumor on the right aryepiglottic fold size of a small cherry, sessile, smooth, yellowish-white, and studded with bright-red points. Tumor was not removed, and became ulcerated later. The patient was lost sight of. (3) Male, aged thirty-two years, had cough for fourteen months, with expectoration and hoarseness; phthisis in both lungs; ulceration in pharynx and larynx. Patient died of phthisis pulmonalis. Grayish-pink tumor, size of pea, consisting of groups of miliary tubercles, grew from posterior laryngeal wall. (4) Male, aged twenty-three years, with family history of phthisis; had pulmonary phthisis for two years. The epiglottis was ulcerated, with other signs of laryngeal tuberculosis. A smooth tumor, size of a small bean, sprang from the under surface of each ventricular band. Microscopic examination of one tumor showed it to be tuberculous. Foà found a small arborescent vegetation at the base of the epiglottis and on the vocal cords in the larynx of a woman who died of pulmonary phthisis. The growth contained giant cells and numerous tubercle bacilli. M. Schaeffer and D. Nasse report the case of a man, aged thirty-three years, hoarse for several months. A tumor grew from the arytenoid region, and covered the posterior third of the left vocal cord. It was the size of a bean, irregular but smooth, and was removed with cold wire-snare. There were physical signs of phthisis at right apex and bacilli in sputum. The tumor was found to be tuberculous on microscopic examination. The patient died in about one year, of phthisis. Dehio's case was a man, aged forty-one years, with no tubercular or syphilitic symptoms, with intermittent hoarseness for over a

year and dysphagia for several months. There were no signs of lung-trouble. A tumor of the left ventricular band almost concealed the left vocal cord, and was removed by laryngotomy as malignant. It was found to be tubercular, containing giant cells and tubercle bacilli. The patient died seven weeks later, of pulmonary tuberculosis. Arthur Hennig's case is interesting: Male, aged fifty-two years, heavy drinker; no heredity; had been hoarse for twelve years. When examined was suffering from attacks of coughing, with dyspnoea and aphonia. There was dulness at right apex, prolonged expiration, and moist râles. There was a tumor, size of a filbert, covered with apparently normal mucous membrane concealing the posterior two-thirds of the left vocal cord and apparently arising from the left ventricular band. A smaller growth was over the right ventricular band, and on the right arytenoid a small

FIG. 1.



Hennig's case.

condylomatous growth. (See Fig. 1.) The larynx was otherwise normal. Laryngotomy was performed, the tumors removed with the Paquelin cautery, and the right arytenoid cauterized. The growths were microscopically tubercular. The patient's condition was good for two weeks; then cough began, with profuse expectoration. An abscess formed in the neck, and the patient died thirty-seven days after the operation. The autopsy showed extensive chronic tuberculosis of both lungs, the left ventricular band ulcerated away, and an ulcer at the site of the smaller tumor. Gougenheim and Tissier's case was a young man. At the base of the epiglottis there was a lobulated tumor nearly filling the larynx, causing increasing dyspnoea and necessitating tracheotomy. Lungs were apparently negative. The laryngeal growth was removed by forceps, and found to be tubercular. After two years the tracheotomy tube was removed. Patient's general condition remains satisfactory.

J. B. Marty's case was a man, aged thirty-two years, showing a reddish, firm, pedunculated tumor of the right ventricular band. He had been hoarse for seven years. The lungs were tubercular. Under treatment with the galvano-cautery, after unsuccessful attempts to remove it with forceps, the tumor disappeared. Cartaz reports three cases: (1) Woman, aged thirty-three, no heredity; general health good, was hoarse for two and a half months. The vocal cords were found slightly reddened without ulceration, and a rounded reddish-gray tumor, the size of a small hazelnut, in the posterior third of the right vocal cord. This was removed with forceps and found to contain granulation-tissue, giant cells, and numerous bacilli. A month later there was an ulcer at the site of the growth, and the vocal cords were infiltrated and ulcerated. The lungs

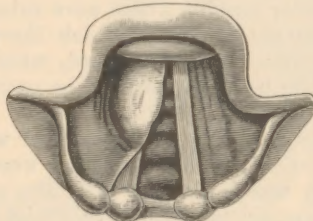
soon showed signs of phthisis, of which the patient died a year later. (2) Man, aged thirty-five, became hoarse after an attack of bronchitis. Grippe some months later aggravated the hoarseness. A grayish-pink tumor the size of a pea was visible on the anterior part of the left vocal cord. Both cords were red and thickened. There was prolonged expiration at right apex. Fragment of tumor removed for examination was lost. The patient died of hæmoptysis six months later. (3) Young woman with tubercular antecedents had cough and hoarseness for one year. A grayish-red conical tumor was seen in posterior commissure of larynx, which was otherwise normal. Dulness and prolonged expiration were found at right apex. The tumor was removed with forceps, and consisted of granulation-tissue containing giant cells and tubercle bacilli. Arpad A. Gerster's case was a man, aged twenty-nine, with physical signs of phthisis for a number of years, with dysphagia for nine months, and later increasing dyspnoea and hoarseness. In the larynx was a tumor of the size and shape of an almond, smooth, and covered with apparently normal mucous membrane occupying the posterior half of the left arytenoid and ventricular band, almost concealing the glottis. After thyrotomy the tumor, with part of the left vocal cord and arytenoid, was removed. The wound healed by first intention, but two and a half months later a tuberculous fistula formed, and the lungs grew worse. The tumor was microscopically tubercular.

Dundas Grant's case: Man, aged twenty-eight, hoarse for six years following laryngitis; had a pedunculated growth from the right vocal cord and a sessile growth in the inter-arytenoid space. The epiglottis was red and oedematous, also the ary-epiglottic folds and the vocal cords. There were ulcers on the right vocal cord and ary-epiglottic folds, but no physical signs of phthisis pulmonalis. The patient died of asphyxia. Coexisting pulmonary disease was found. Microscopic examination of growth is not mentioned.

Avellis has written a very thorough article on this subject. He reports thirteen cases from the clinic of Moritz Schmidt in Frankfort. I have verified all but a few of his references, and have found his paper of great assistance in preparing my own. The following are brief abstracts of his cases: (1) Man, aged twenty-five, was hoarse for several months. In the larynx was a smooth, red growth, size of half a split pea, from under surface of the right vocal cord, having the gross appearance of a fibroma. On removal and microscopic examination it was found tubercular. Six months later there were serious tubercular changes in the larynx, and three months after this the first evidence of phthisis in both apices was discovered. (2) Woman, aged forty, had tumor covered with normal mucous membrane growing from right ventricle. Lungs were apparently normal. Tumor was removed with curette and lactic acid applied. Growth found microscopically tubercular. A year later the larynx was normal. (3) Man, aged thirty-two, hoarse one year, had a polyp on anterior third of right vocal cord; removed with forceps and found tubercular. Larynx was otherwise normal. Seven months later there were ulcerations in the larynx and evident tuberculosis of lungs. (4) Woman, aged nineteen, hoarse nine months, had red, smooth tumor of ventricular band almost covering right vocal cord (see Fig. 2), beginning ulcer on the posterior laryngeal wall, and signs of phthisis at right apex. The greater part of the tumor was removed with laryngeal forceps. The rest gradually disappeared and the ulcer

above mentioned healed. Later signs of phthisis developed in the left apex, the general condition grew worse and the tumor recurred. This was removed. The patient was lost sight of. (5) Woman, forty-five

FIG. 2.



One of Avellis's cases.

years of age, hoarse for six months; showed a reddish-gray cauliflower growth under anterior part of glottis and phthisis in both apices. Tumor removed with forceps and found microscopically tubercular. One year later tubercular ulceration appeared in the larynx. Tracheotomy was required for great subcordal swelling. (6) Does not seem to belong to this group, and is omitted. (7) Man, aged thirty-three years, had for a year previous phthisis at both apices. In larynx was a nodulated growth covered with mucous membrane, rising from the right ventricle and almost covering the right cord. This was removed with the galvano-cautery loop. The wound healed. Six weeks later there was infiltration of the ary-epiglottic folds and ulceration of the epiglottis. Three months later the patient died of phthisis pulmonalis. (8) Man, aged eighteen years, had in larynx two tumors size of pea in the left ventricular band, found to be tubercular on microscopic examination. The larynx was otherwise normal. Lung-symptoms first appeared four months after the growth was seen. (9) Man, aged twenty-seven years, had dry pleurisy for two years, hoarse for two months. Left apex infiltrated. Tumor on anterior part of right ventricular band, partially removed with forceps and found tubercular. Three months later there was no sign of the tumor. Patient had another attack of pleurisy, and was lost sight of. (10) Woman, aged twenty-three years, hoarse for three months, had tumor under left vocal cord. A piece removed was found tubercular. Dulness and râles at left apex. (11) Man, aged twenty-four years, hoarse three months, had tumor size of half a pea on anterior part of right ventricular band. Larynx otherwise normal. Dulness at right apex, tubercle bacilli in sputum. Tumor removed, but swallowed by patient. (12) Woman, aged fifty-one years, cough for many years, hoarseness two years; had for six weeks dyspnoea and dysphagia. Occasional râles, but no dulness in lungs. Smooth tumor with broad base on left vocal cord removed with cold wire snare, and found tubercular (giant cells and bacilli). (13) Woman, aged nineteen years, with slight pulmonary phthisis; had some hoarseness caused by a tumor of the ventricle, and ventricular band covering half the vocal cord. Removed with forceps and found tubercular. General condition improved. Larynx sound one year later.

Trékaki's case was a syphilitic man, aged thirty-five, with no tubercular family history. There was gradually increasing dyspnoea. Larynx

gological examination was impossible. The lungs were apparently normal. General condition was good, except for slight elevation of temperature. Patient died of sudden asphyxiation. The autopsy revealed a sessile tumor of the left ventricular band almost completely obstructing the larynx. The tumor was a tubercular infiltration of the muscle of the ventricular band. There were tubercular nodules in the trachea. Schwartz reports a case in which there were vegetations in the posterior third of the right vocal cord, which on microscopic examination were found to be tubercular. The patient died later of pulmonary phthisis.

Heryng reports three cases of hemispherical white sessile tumors on the false cords posteriorly. The larynges were otherwise normal. Phthisis of the lungs was beginning. In one case the tumor was removed and found to contain some small tubercles and giant cells.

The case which I have to add to the above is the following: Mrs. F., aged thirty-one years, with no tubercular family history, was first seen by me on May 9, 1893. At ten years of age she had a severe attack of cerebro-spinal meningitis. Since then she has always been well until three years and a half ago (November, 1889), when she took a severe cold from being in a damp house. This cold was accompanied by laryngitis. She has been hoarse ever since. The laryngeal growth was discovered two years ago and numerous unsuccessful attempts made at its removal. The patient did not wish to undergo thyrotomy, which one surgeon suggested as the only way to remove the growth. When first seen by me the patient weighed 120 pounds. She was a small woman, and looked in fairly good condition. She was quite hoarse, experienced some difficulty in speaking, and had occasionally some dyspnea on exertion. Laryngological examination showed a smooth, sessile, dimpled growth, covered with mucous membrane, somewhat redder than the surrounding, springing from the left ventricular band and concealing during respiration most of the left vocal cord and part of the right. The larynx was otherwise normal except a slight injection of the vocal cords. Fig. 3 gives a fair idea of the relative size and appearance of the growth.

FIG. 3.

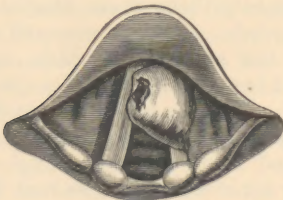
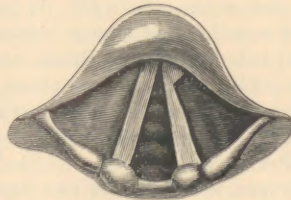


FIG. 4.



An eight per cent. solution of cocaine was sprayed into the larynx and the growth removed with the cold wire snare. The instrument used was Hooper's combined snare and écraseur, with a Schrötter tube and No. 4 piano-wire. I was fortunate enough, after only a very few trials at one sitting, to get the loop well around the base of the tumor. After tightening the loop a few turns of the écraseur were required to cut through the firm attachment. When this was done the growth was immediately coughed up. Hemorrhage was very slight. The growth

FIG. 5.



was very firm, having the gross appearance of a fibroma. The wound healed quickly. Fig. 4 shows the appearance of the larynx the day after the removal of the growth. The patient was seen on March 12

FIG. 6.



and October 1, 1894, when the larynx still looked practically as in Fig. 4. On the later date the patient was in excellent health and weighed 145 pounds. Her voice is clear, but she says it gets tired if she uses it very much. A thorough examination of the lungs was entirely negative. Dr. W. F. Whitney very kindly made a microscopic examination of the growth, and reports as follows: "The sections are from an oval growth of irregular outline, about ten mm. by five mm. in diameter. The bulk of the growth is made up of series of minute nodules, extensively cheesy, and in which are scattered multinucleated bodies (giant cells). These nodules are separated by a zone of round-cell tissue of varying width. Here and there the contiguous edges of the nodules touch, giving thus a clover leaf outline to the group. This new growth is covered everywhere, except at one minute point, by a layer of stratified columnar epithelium, which in part lies directly upon it, and in part is separated by a narrow band of connective tissue. This last is very rich in bloodvessels with thick (arteries) and thin (vein) walls. There was also one bundle of nerve-fibres. The growth is a nodule of miliary tubercles growing in a submucous tissue."

Fig. 5 is a low-power enlargement of a microscopic section of the growth. The side bracketed and marked (a) was nearest to the surface of attachment. The reason that this side is covered with mucous membrane is that the sections, although perpendicular to the surface of attachment, did not quite reach it, but cut through an overhanging portion of the growth. The portion inclosed in brackets gives a good idea of the diameter of the attached surface. Fig. 6 is a further enlargement of the tubercular nodule marked (b) in Fig. 5.

I have collected here the reports of 42 cases of laryngeal tumors. Of these, 13 are more or less incomplete; but of the 13 the majority were undoubtedly tubercular tumors. As far as I know, the only other writers who make any reference to the existence of tubercular laryngeal tumors are Mandl, Gottstein, and McBride. Gottstein says: "Tubercular laryngeal tumors are growths rising sharply from their surroundings, either solitary or two or more, rounded, of smooth surface, from the size of a pea to that of a hazelnut, microscopically consisting in part of thick fibrous tissue, in part of tubercles closely grouped. In the tubercles are bacilli." McBride says: "In some rare cases the only manifestation of phthisis laryngea is the presence of *tubercular tumors*." Schwartz (*loc. cit.*) says: "Sometimes tuberculosis manifests itself under the form of veritable tumors projecting into the larynx, to ulcerate later. When not ulcerated they may be taken for tumors of a malignant nature, if there exist no other signs of tuberculosis."

Of the 29 cases in which the history may be considered practically complete and satisfactory, in 3 the tumor was not discovered until after death. In these 3 cases there was also pulmonary tuberculosis. Only 4 of the patients of whom the age is mentioned were over forty, and only 3 under twenty years of age. The affection is, therefore, more frequently one of middle life. Of the cases in which the sex is mentioned, 23 were male and 9 female. In these two particulars this variety of tuberculosis

of the larynx coincides with the disease as it usually manifests itself in the larynx. According to Bosworth, in 500 cases of laryngeal tuberculosis reported by McKenzie, 356 occurred between the ages of twenty and forty; 365 were males and 135 females. In the 26 cases in which the growth was seen during life the lungs were tubercular at the time the growth was first seen in 17. Of the 9 remaining cases, 5 developed signs of phthisis pulmonalis later, leaving 4 in whom pulmonary signs could not be found several months to a year and a half after the removal of the growth. Five of the growths are described as having the appearance of a papilloma, while the others had the appearance already described in the quotation from Gottstein. In 28 cases the tumors were single, while in 6 there were two or more. The tumors were rarely ulcerated, and the mucous membrane covering them had generally a normal appearance. In color the growths vary from a pinkish-gray to a dark-red. They are generally firm, but occasionally soft. As a rule, they are sessile, but they may be pedunculated. Their most common sites are the ventricular bands, vocal cords, and ventricles. They have been also found on the posterior laryngeal wall, the epiglottis, arytenoids, and ary-epiglottic folds, under the anterior commissure, and in the trachea. They are apparently of slow growth, and may run a very chronic course. In many of the cases the tumor was known to have been in existence for a year or more, while in others the history of hoarseness for several months to several years may, perhaps, be taken as a fair indication of the length of time the tumor was in existence. The symptoms are hoarseness, often dyspnoea, and more rarely dysphagia, without pain, as a rule.

Are these growths to be considered primary or secondary? It seems to me that there is more than a strong presumption that they are secondary, a metastatic deposit from a primary focus elsewhere, probably in the lungs. The history of the reported cases would seem to bear out this conclusion: the fact that in most cases physical signs showed the coexistence of pulmonary phthisis, while in others the physical signs developed soon after the growth was seen. In the few cases in which they did not develop a tubercular focus may, nevertheless, have existed, for it is a well-known fact that tubercular foci, which were never suspected during life, are found in the lungs at autopsies. And, finally, the fact that these growths are covered with apparently intact mucous membrane is a strong argument against a direct primary, local infection. Pathologically, these growths are generally made up of round-cell tissue surrounding tubercles, often cheesy, degenerated, and containing giant cells. Tubercle bacilli can generally be found.¹

These growths may be mistaken for a fibroma, papilloma, or sarcoma.

¹ Dr. J. L. Goodale has kindly made a bacteriological examination of about fourteen sections from my specimen, but with negative results.

If there is coexisting phthisis pulmonalis, the probability is strong that the tumor is also tubercular. In the absence of pulmonary signs it is practically impossible, without microscopic examination, to make a positive diagnosis. It is more than probable that not a few cases reported as fibromata belong under this head. Indeed, it would seem advisable to examine microscopically all supposed papillomata, although this form of tubercular laryngeal tumor is apparently exceedingly rare. The unimpaired mobility and absence of pain would aid in a differential diagnosis from a malignant growth.

The main indications for operations are dyspnoea and dysphonia. These growths have been treated by various applications. They have been removed *per vias naturales* by means of the cold wire-snare, the forceps, guillotine, and galvano-cautery loop. They have also been removed after thyrotomy. On account of the firm character of these growths forceps are, as a rule, ill adapted to their removal. The best instruments would seem to be the cold wire-snare or galvano-cautery loop. In some cases a previous tracheotomy is required. In some, owing to the shape, size, or position of the growth, thyrotomy is necessary. The use of lactic acid or the galvano-cautery on the site of the growth after its removal, to destroy, if possible, any tubercular tissue that may remain, would seem to be indicated in view of the number of cases in which ulcers occurred after the removal of the growth. The reported cases seem to me to indicate that there is no danger of a reinfection of the organism from the setting free of bacilli from the growth, although there is room for a difference of opinion on this point from the fact that in a few cases the first physical signs of pulmonary tuberculosis developed very soon after the removal of the growth. To my mind this is probably simply a coincidence, the tubercular process, which had probably been slowly going on or resting quiescent for some time in the lungs, first making itself evident to physical examination at this time. Nor was there in any case an acute miliary tuberculosis such as might be expected to arise from a sudden setting free of a number of tubercle bacilli into the circulation. In a few cases the result of operation was brilliant, and in most there was great relief from the local symptoms for a longer or shorter period.

In conclusion, I wish to thank Dr. W. F. Whitney for his careful microscopic examination of my specimen, and also for his kind supervision of the microscopic drawings, and Dr. W. D. Hall for preparing and mounting the microscopic sections.

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